The Environmental Quality Corridor (EQC) policy, as found in the Environment section of the Policy Plan volume of the County's Comprehensive Plan, does not directly address stormwater discharges; however, it is particularly relevant to the County's overall water quality management program as it serves to identify, protect, and, in some cases, restore environmentally-sensitive resources. Specifically, the EQC policy recommends the preservation and restoration of areas including floodplains, steep slopes (slope gradients of 15% or greater) adjacent to streams or floodplains, wetlands connected to stream valleys, minimum stream buffers (variable in width depending on topography), and sensitive habitat areas. While there is no County regulation requiring EQC protection (RPA and floodplain provisions in the County Code protect many, but not all, EQC areas), the application of the EQC policy during the zoning process has been effective in protecting, and in some cases restoring, environmentally-sensitive areas.

Another area of interest with respect to the Comprehensive Plan is an Objective addressing water quality and stream protection; there are a series of policy statements in the Plan that are related to this Objective. This section of the Plan was amended in the year 2000 to provide explicit support for low impact design (LID) measures, and opportunities to implement such measures are explored during the zoning process. In a number of cases, staff has negotiated successfully for LID measures such as reductions in proposed impervious cover and the provision of biofiltration facilities (rain gardens) to provide water quality control through infiltration.

The Environment and Development Review Branch reviewed 214 rezonings and related applications (e.g., amendments), 80 special exceptions and amendments, and 80 special permits, in 2003, for environmental considerations.

In September, 2002, the Board of Supervisors adopted a Plan Amendment to revise the criteria that are used to evaluate residential development proposals. This amendment included a heightened emphasis on environmental protection, including stormwater management. The following text was added to address water quality and drainage issues; this text is applied during the review of all residential rezoning requests:

> ***Water Quality**: Developments should minimize off-site impacts on water quality by commitments to state of the art best management practices for stormwater management and low-impact site design techniques.*
>
> ***Drainage**: The volume and velocity of stormwater runoff from new development should be managed in order to avoid impacts on downstream properties. Where drainage is a particular concern, the applicant should demonstrate that off-site drainage impacts will be mitigated and that stormwater management facilities are designed and sized appropriately. Adequate drainage outfall should be verified, and the location of drainage outfall (onsite or offsite) should be shown on development plans.*

DPZ staff is implementing this Comprehensive Plan guidance during the rezoning process for proposed residential projects.

Implementation of Infill and Residential Development Stormwater and Erosion and Sedimentation Control Initiatives

During the last decade in the County, stormwater management has received increased attention relating to water quality issues. This attention, coupled with development patterns, has generated significant challenges to the County's ability to deal effectively with stormwater. An effort to address these challenges was the "Infill and Residential Development Study" requested by the Board of Supervisors in May 1999. This study was completed and recommendations were accepted by the Board of Supervisors at a public hearing January 22, 2001. The infill study provides a framework for discussion of issues as well as policy and regulatory reform concerning residential development in the County. Many of the storm water and erosion and sedimentation control elements of this study are more encompassing and apply to other types of development in the County as well.

The Infill and Residential Development Study staff have reviewed the effectiveness of current policies regarding erosion control and storm drainage with the multiple goals of minimizing impacts of storm water from a proposed development on downstream properties, limiting the impacts of stormwater management facilities on neighborhoods, ensuring that developers are accountable for impacts from their developments, and upgrading existing inadequate facilities. Some of the recommendations presented include:

- An enhanced erosion and sediment control program involving improvements in education, policy, regulations, and enforcement as well as implementation of innovative practices;
- Adoption of innovative BMP policies to reduce impact during development and allow greater flexibility in the engineering of proposed sites;
- Improved design and performance of proposed storm water management facilities by implementing a technical review of certain components during the rezoning process;
- Enhanced requirements and better definitions for the design professionals for evaluating the adequacy of stream channels for increased runoffs due to new developments during the design process;
- Identification and survey of water impoundments downstream of a proposed development that could be impacted by a proposed development, and assignment of accountability for impact resolution;
- Adoption of a program to retrofit existing non-water quality control facilities to perform this function as well; and
- Development of a BMP monitoring program.

Implementation of the recommendations is continuing in all areas of the initiatives identified in the "Infill and Residential Development Study." Significant progress was made toward fulfillment of the storm water and erosion and sedimentation (E&S) control initiatives over the past year. Many of the initiatives have been completed in prior years and further completion or substantial progress was made, most recently, in the following key areas:

- Completion of a Violation Matrix to better enable staff to enforce the E&S requirements and provide industry with a more predictable path toward resolution of violations;
- Continued analysis of measures and methods to improve the efficiency and capabilities of E&S site controls including drainage area to temporary inlets, use of devices such as the Faircloth Floating Skimmer, chemical erosion prevention products, or bonded fiber matrix products; and
- Established a committee comprised of staff and industry professionals, in conjunction with the Engineers and Surveyors Institute, (ESI) to review and evaluate the current adequate outfall provisions with intent to recommend policy and regulatory changes to help address these issues.

Progress is continuing in all remaining areas and further completion is anticipated over the next year.

Zoning Ordinance and Subdivision Ordinance

DPWES enforces the Zoning Ordinance and Subdivision Ordinance criteria related to stormwater for new development and redevelopment through its plan review process. This ensures that BMPs are implemented on all new developments in compliance with the Occoquan Water Supply Protection Overlay District and the Chesapeake Bay Preservation Ordinance. The on-site inspection program and Bonding assures that sites are constructed in accordance with approved plans. During 2003, 434 site, subdivision and public improvement construction plans were reviewed for code compliance; of these, approximately 197 were approved for construction.

The Zoning Enforcement Branch of the Department of Planning and Zoning investigates complaints of possible Zoning Ordinance violation issues. The complaint investigation activity of 2003 for the complaints related to stormwater issues and the status of follow-up are summarized in ***Table 2***. The complaints related to potential stormwater impacts are sorted into the following categories:

1) Drainage, which includes such items as obstructed streams or blocked drainage structure inlets, backyard flooding, etc.;
2) Junk yards, which involve construction debris, abandoned vehicles, used appliances, etc., often located on vacant lots;
3) Outside storage located at an occupied residence, which includes general items such as bikes, boats, batteries, used lumber, tires, empty paint or fuel;
4) Storage yards, which may involve construction-related material (including mobile homes left behind), roof material, tires, etc.

Table 2. 2002 Zoning Ordinance Complaint Cases

	Complaints Received	Cases Closed	Cases Pending
Drainage	25	21	4
Junk Yards	30	22	8
Outside Storage	477	436	41
Storage Yards	16	11	5
Total	548	490	58

a.3) Roadways and Parking Lots

The County maintains public facilities such as: libraries, fire stations, governmental centers, park and rides, and a number of road segments totaling approximately 5 miles in cumulative length. Many of these segments are without curb and gutter or catch basins. In an effort to limit the discharge of sand and deicing materials into the County's streams, only those roadway lengths determined to pose a safety hazard are treated. Magnesium chloride is used on sidewalk applications, as it is more environmentally acceptable than sodium chloride. Where they exist, catch basins are cleaned on a regular basis and at the end of the winter season to remove accumulated sand. Strategies are being developed to use other deicing chemicals which are even more environmentally acceptable.

Due to the widespread use of the public parking facilities in the County, routine sand and deicing

materials treatment is provided during snow clearing operation with sand and deicing materials during snow clearing operations. In an effort to reduce the discharge of these materials into the County's streams, the County's six park and ride lots, four commuter rail stations, and one bus transit facility are swept once each spring.

a.4) Retrofitting

Retrofitting of Watersheds with New Flood Control Facilities

Given limited funding sources, implementation of detention pond retrofit projects rely primarily on coordination with active projects during the rezoning and plan approval process. As funding permits, either through general fund appropriations, pro rata share revenues, or developer participation agreements, retrofit projects are implemented. The following tables list the regional ponds which have or will achieve retrofit benefits. ***Table 3*** lists those projects, which have been bonded or were completed during calendar year 2003. ***Table 4*** lists those projects which currently have a submitted design plan incorporating construction/retrofit of a facility which will provide BMPs for existing development. It is noted that this list may not be all-inclusive. ***Figure 20*** is a typical regional pond.

Table 3. *Regional Facilities Bonded or Completed During 2003*

Facility Name	New facility	Retrofit existing facility	Total area controlled (acres)	Area of existing development retrofitted with BMPs (acres)
Regional Pond C-41	yes		92	na
Regional Pond D-47	yes		111	90
Regional Pond (D-151)	yes		134	na
Regional Pond (H-9)	yes		100	60
Regional Pond (R-8)	yes		100	20
Regional Pond (R-161)	yes		235	50
Total			772	220

na = not available

Table 4. *Regional Facilities in Design or Land Acquisition Phase During 2003*

Facility Name	New facility	Retrofit existing facility	Total area controlled (acres)	Area of existing development retrofitted with BMPs (acres)
Regional Pond C18	yes		442	342
Regional Pond C20 (Intl. Town & Country Club)	yes		515	252
Regional Pond C24	yes		99	0
Regional Pond C28	yes		181	124
Regional Pond C35	yes		109	30
Regional Pond C54	yes		328	95
Regional Pond D02 (Great Falls Hunt)	yes		246	33
Regional Pond D14 (Little Run Farm)	yes		147	79
Regional Pond D-46	yes		277	180
Regional Pond H02	yes		101	15
Regional Pond R-16	yes		120	105
Regional Pond R17	yes		322	322
Reston 913		yes	315	315
Regional Pond S05	yes		264	264
Regional Pond S07	yes		453	453
Vine Street	yes		229	229
Weltman Estates		yes	99	99
WolfTrap		yes	302	302
Total			**4,549**	**3,239**

na = not available

Figure 20. New Extended Dry Regional Pond, created wetlands will be added in the spring of 2004.

Rehabilitation and Retrofit of County Maintained Stormwater Management Facilities

In 2003, ten (10) stormwater management ponds, serving a total drainage area of 436 acres, were rehabilitated and/or retrofitted, ***Tables 5 and 6***. Rehabilitations consisted of repair, replacement, or modification of the facility to meet or exceed safety and functional requirement and to extend the service life of each facility. Retrofits employed the use of shallow wetland marshes to enhance nutrient uptake and provide an increase water absorption and transpiration. A secondary effect of wetland marshes and naturally vegetated pond floors is the creation habitat for wildlife. Below is a summary of the sites:

Table 5. Retrofitted and Rehabilitated Facilities with Enhancements

Pond Name	Tax Map	Access Address	Drainage Area (Ac)	Season Completed
Donegal Oaks Pond 1	89-4	Open outlot at Donegal La/ Springtree La	10	Summer 2003
Beaufort Park Sec. 1	21-3	914 Helga Place	22	Spring 2003
Sequoia Farms Sec 10	44-3	7828 Lakeland valley Dr.	11	Summer 2003
Sully Station Phase 1 Pond 3	43-4	14815 Harvest Ct.	34	Winter 2003
Little Rocky Run Pond 2 (Sec 45)	65-2	13827 Springstone Dr.	26	Winter 2003
Little Rocky Run Pond 1 (Sec 41)	65-4	13640 South Spring Drive	8	Winter 2003
		Total	111	